Botanical Gazette.

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EDITORIAL.—Never have our friends come forward more readily to the support of the GAZETTE than in the beginning of this fifth volume. More subscriptions have been received than ever before in the same time. Many letters have come expressing surprise that such a publication as the GAZETTE existed, for the writers had never heard of it. Now this kind of knowledge will have to be spread by botanical friends, as it would be impossible to have the GAZETTE advertised in such a way as to come to the knowledge of every botanist. If our friends, in their correspondence, will mention the GAZETTE and recommend, at least, applying for a sample copy, many persons will be reached who will be glad to become subscribers. The GAZETTE can pay for itself now, but some such effort to increase our subscription list will enable us to pay for plates, by which we can secure some exceedingly valuable articles. That our friends may know in what estimation the GAZETTE is held by our leading botanists and thus feel a confidence in recommending it to any of their friends, we make the following quotation from the American Journal of Science and Arts for February: "It (the GAZETTE) is an organ for communication among botanists, for the prompt publication of notes and observations, and of those contributions to knowledge which every accurate observer may do his part in, but which must be collected in order to be preserved and utilized. New species are published or announced in it, but it is rather an organ for new observations and botanical news. It is well conducted; it is very useful; we learn that it is in a condition which insures its continuance, and that every increase in the subscription will go towards increasing its value. Our botanists should now see that it is worthily supported. Indeed they can hardly do without it."

THE GENUS LEAVENWORTHIA has been almost from the first involved in some difficulty as to the species. Having now some new material, I wish to bring the present state of the case before the botanists of the Trans-Alleghanian States it inhabits in order to obtain from them further collections and observations in the course of the ensuing spring and early summer. With such aid I may then hope to determine the number and distinctions of the species.

Two species were originally established by Dr. Torrey; *L. aurea*, with distinct style and embryo nearly straight, and *L. Michauxii*, with style almost wanting and radicle oblique. The corolla of the first was said to be yellow, upon the authority of the original collector, Dr. Leavenworth. Indeed one of his specimens in the Shortian herbari-

um is ticketed "flowers yellow"; the other "flowers golden yellow." Both are from the Irish Bayou settlement [N. E.] Texas," and though Dr. Leavenworth thought they might be distinct species, they differ only in that one has all the peduncles radical and one-flowered, while the other is subcaulescent with central peduncle few-flowered. The petals show no trace of the yellow color, but rather seem to have been white with a purplish tinge.

Of the second species, described from Dr. Short's Kentuckian specimens, Dr. Torrey could only say that the flowers in his opinion were pale yellow. Dr. Short does not record their color, either in the specimens he sent to Dr. Torrey or in his own herbarium. But all the specimens received of *L. Michauxii*, that is all with an even and rather broad silique and a very short or almost obsolete style, have white or purplish tinged petals with at most a yellow base. But the same is true of all the specimens (of which the color is noted) received from Alabama, Tennessee, etc., which, having their oblong-linear or lanceolate pods surmounted by a distinct and rather slender style, were taken for *L. aurea;* also in plants raised here from the seeds in different years. At most the base or claw of the petals was yellow, the lamina white varying to purple. Accordingly, in the Manual, neglecting the style, and the embryo, I referred all these to *L. Michauxii*, and reduced *L. aurea* to a synonym or a yellow-flowered form of it.

But now, with all the available material before me, including a peculiar yellow-flowered form recently detected in Tennessee by Dr. Gattinger, I am disposed to recognize four forms as probable species, and I will here note their distinctions, making at the same time an appeal for further information before coming to a full conclusion. The forms or species before me are as follows:

1. L. MICHAUXII, Torr. Silique oblong-linear, not torulose; style very short or none; seeds orbicular and rather broadly winged; radicle very oblique, approximated on one side to the edges of the cotyledons; petals white with purplish tinge and a yellowish claw. – (Tennessee, on rocks at Knoxville, *Michaux*, if this is indeed *Cardamine uniflora*, Michx., but I have noted that his specimens have a distinct but short style.) Barrens of Kentucky, *Short*. Charlestown, Indiana, *J. M. Coulter*.

2. L. AUREA, Torr. Silique oblong-linear or narrower, not torulose; style conspicuous, commonly as long as the breadth of the silique; seeds of the preceding; but the radicle merely oblique, sometimes slightly so; petals of the preceding or yellow! —Arkansas and N. E. Texas, *Leavenworth*, with flowers said to be yellow. Alabama, *Buckley, Hatch, Peters*, etc., with petals purple, pale rose, or white, with yellowish base, sometimes fully half inch long.

L. TORULOSA. Silique linear, conspicuously torose; style fully equalling the breadth of the silique; seeds broadly oval, narrowly winged; radicle nearly transverse, strictly applied to the edges of the cotyledons at the base on one side; petals purplish with a yellow base.—Barrens of Kentucky, *Short*. Very abundant near Nashville, Tennessee, *Dr. Gattinger*.

L. STYLOSA. Slender, strictly stemless; silique or rather silicle

oval or broadly oblong (about 4 lines long and fully two inches wide), plane, surmounted by a slender style of fully 2 lines in length; seeds only 3 to 6, orbicular, distinctly winged; embryo as in the preceding; petals pure golden yellow.—Cedar barrens, Lavergne, near Nashville, Tennessee, *Dr. Gattinger*, June 2, 1879.

Fresh specimens and notes are solicited by ASA GRAY.

AUTOMATIC MOVEMENT OF THE FROND OF ASPLENIUM TRICHOMANES.—Mr. E. J. Loomis, of the Nautical Almanac office, Washington, recently showed me a phenomenon which I suppose has never before been noticed, and which is commended to the attention of botanists. A tuft of *Asplenium Trichomanes*, gathered last autumn in the mountains of Virginia, is growing in his house, in a glass dish. About two months ago he noticed that one of the fronds—a rather short and erect one which is now showing fructification—made quick movements alternately back and forth, in the plane of the frond, through from 20 to 40 degrees, whenever the vessel was brought from its shaded situation into sunlight or bright daylight. The movement was more extensive and rapid when the frond was younger. When I saw it on the 23d of January, its compass was within 15 degrees, and was about as rapid as that of leaflets of *Desmodium gyrans*. It was more rapid than the second hand of a watch, but with occasional stops in the course of each half vibration. This was in full daylight next a window, but not in sunshine. No movement had been observed in the other fronds, which were all sterile and reclining, with the exception of a single one which was just unfolding, in which Mr. Loomis thinks he has detected incipient motion of the same kind.

It is very easy to obtain this little Fern and to set it growing. We may expect further observations to be made upon it without delay.—ASA GRAY.

HOW TO MAKE PERMANENT BOTANICAL OBJECTS FOR THE MICROSCOPE.—In the GAZETTE for September, 1879, I had a short paper on staining and double staining of vegetable tissues. I desire now to add a few hints on the previous and the subsequent stages of the preparation.

Mounted objects may be divided into two classes, i. e., the opaque, and the transparent;—the former to be seen by a light (more or less strong) from above, and the latter by light passing through the object from below.

The first thing for the preparer to decide upon, is, which of these two classes shall any object come under?

If the former, the preparation is extremely simple. The whole problem resolves itself into making a suitable case for the treasure. To give a tangible idea suppose we have the seed of a Portulaca or the scarlet tip of a Cladonia, or the yellow apothecium of a Theloschistes. The first thing to do, is to see that your cage (or to speak strictly, your cell) is opaque and of sufficient depth to hold the object. Opticians now keep wooden slides with a central concavity ready to close by placing over it a glass cover. These are cheap and neat.

Or you may take the ordinary glass slide and fasten on to it by marine glue, the rubber, glass, block tin or other cell of any desired depth. Any ordinary work on the microscope will give instruction on the use of this or a similar cement. Supposing now that the cell is made and fastened to the glass, I then paint a thick coat of the asphaltum cement over the whole bottom (inside) of the cell so made. This gives you an opaque field. When the object has been properly prepared, by cleansing, I put another coat of the asphaltum on over the first, and on this I place the object. There it becomes cemented as the varnish hardens and nothing is left save to put on a cover of the same or nearly the same diameter as the cell, and then lay on over the outer margin a ring of asphaltum, zinc or any suitable cement, which excludes the air and fastens the cover. This is all sufficiently simple. And it may be well to add that opaque objects are too much neglected because they are not to be used with other than a low power. The smaller lichens may thus be mounted bodily, and so far as their mere external characteristics go, studied more satisfactorily than by any other method. Beside we may then have them safe, handy, and in permanent keeping. Type specimens, if small, should as a rule be so preserved.

The second class:—objects through which the light is seen, i. e., transparent objects. Some are so thin as to need no sectioning and may, or may not, require the bleaching process described in my previous paper. Suppose they are not so thin! How are they to be made so? Evidently by a sharp knife of some form. There are costly instruments of this kind made. Allow me to assure you, the assertions of dealers to the contrary notwithstanding, that you do not need any such knife for any ordinary work. A razor sharp enough to shave with is the best and handiest instrument you can use. Neither do you need to have the hollow ground out of one surface providing you hold it as you should hold things, i. e., with a firm hand. So then you may well be satisfied with a good razor; providing always that it be sharp Next! How shall the object be held whilst being sectioned? First:—it may be held in the hand and if the cutting hand be reasonably steady a good section may be secured. Second:—it may be held in an instrument where it is simply screwed fast, and after the first cut gives you a flat surface, by a turn of a screw in the bottom the object thrust forward so that the next cut shall be of any desired thickness. This is my favorite means of holding the object, and if I have one so small that I cannot so secure it, I take a bit of carrot of the proper size make a slit in this, in which I put the minute object; then I screw it and the carrot fast together. Some use potato as a substitute for the carrot but it is not so good, as the starch grains become separated and adhere to the object giving some trouble to remove them. Other objects too small even for the carrot may be secured by making a paper cone of proper diameter to fit the section holder (section cutter as it is called, but this name should be retained for the knife), then melt paraffine and pour in until you have enough, then in this set your minute objects. Allow the paraffine to harden and with, or without, the paper cone you may screw it into the holder

as you did the carrot. Then, third: —There is a section holder which is to be used only with the paraffine. It is an elegant, somewhat costly instrument, with I think on the whole a more limited range of usefulness than the second form I have described. But whether you take the second or the third form be sure that it has a glass top for the cutting surface. Brass does well for a time, but sooner or later becomes rough and so blunts the edge of the cutter, which can never be too sharp.

Now as to the act of cutting: some objects may be cut dry, others may require to be moistened with water or even with alcohol, and a little of the same fluid may be allowed along the knife edge to secure a good uninjured specimen. The value of a section does not (beyond certain common sense limits) depend on its size. A small, thin section may, nay will, reveal more structure than a large one thick enough to be nearly opaque. Hence, make your object as large as you can to make it thin, but no larger.

Suppose it is made, and made properly, worthy of mounting permanently. How shall we do this? First, remove all dirt by washing in clean water, then remove all air by immersing in water, or glycerine or alcohol, depending on what you mean to do with it next, and also in which we shall distend or shrink the object least. Remember here the stages I gave in my previous paper concerning the repeated alcohol baths it must have before it comes to be rendered clean in oil of cloves. This rids you of all water and makes it as transparent as it can be made. Now if the object has had the preliminary stages in alcohol and oil, its suitable and final mount should be balsam. I have cast aside all balsam with benzols and balsam with chloroform and come down to the slower evaporations—what is *called* balsam pure. Some objects are not injuriously distorted by this process. Indeed some delicate spores even stand it well. But this is not the rule. Spores do not generally tolerate it and retain their original symmetry and size. Hence we must find some other process.

Take for example a section of *Solorina saccata*—a lichen with charmingly large and handsome spores. I would rid it of air by first putting it in water, then after an hour or two, into glycerine, where it may remain twelve or more hours. And then I mount it in Farrants medium, (bear in mind Farrants, not Tarrants medium) which Dr. Carpenter says is made by "dissolving four parts (by weight) of picked gum arabic in four parts of cold distilled water, and then adding two parts of glycerine." Make without heat, stir but don't shake it, and when it is made, strain it through washed cambric, put it into a bottle along with a small lump of camphor which will prevent fungi from developing in the sweet solution. Now, shall you make a cell or not, for your object? Not unless that object is thicker than (for a simple standard) a sheet of writing paper. If however the glass cover cannot be made to remain flat on the slide, or if an appreciable distance exists between the slide and the cover, then you need a cell. What it shall be made of depends on its required thickness. If a deep cell is needed then you must go back to the rubber, block tin, or other cells such as I have already named. If however you want

a shallow cell, then a ring (run from the turn table) of Bell's cement, of one or two coats is all sufficient. This cement you may make yourselves by dissolving shellac in strong alcohol. It has the very great merit of drying very quickly and of resisting the action of glycerine, the last a most important quality. Put then your Solorina or other like object in the Farrants medium, with or without a cell, and cover it with thin glass, put on so as to drive the air out by *pressing* down one side first and then slowly lowering the other to the horizontal, and under the gentle pressure of a wire clamp allow it to harden. Next remove the exuding surplus medium and in a few hours run from a brush a coat of Bell's cement around the edge of the cover and your slide will be done. These processes are more simple than they appear from a description. Carbolized or camphor water is also a good medium for mounting spores or sections of lichens and fungi in.

As for instruments; whilst I do not regard the turn-table or the section holder as essential, I do consider them as most important aids.

One other point. To clean glass covers I fill a small wide-mouthed bottle with strong sulphuric acid, then *one by one* dip in my covers; then they are thoroughly coated with the acid, then after remaining in the acid several hours I pour it off, and by repeated washing in clean water remove most of the acidity, then I put in Labarraques solution, and after a few hours in this I pour it off and wash the bottle and and glass with two or three waters and the covers are clean. To keep them so, I put in clean water, and cork the bottle. And to use the covers you have merely to dry them and they are ready for service.

In the above, hastily written, simple statements I have advanced little or nothing new, but have given the modes my own experience has approved, without regard to the sources whence they were derived. It is however, fair that I should state my attention was called to the great value of Bell's cement and Farrants medium by my friend, Prof. Barbeck, of Philadelphia, a most accomplished cryptogamic botanist.—J. T. ROTHROCK.

PTERIS AQUILINA.—I have received from Mr. F. A. White, an esteemed Florida correspondent, a specimen of *Pteris aquilina*, var. *caudata*, which measures 13 feet and 4 inches from the base of the stipe to apex of frond. The stalk measures from ¾ to 1 inch in circumference in its present dried state, and is exactly 6 feet in length, thus leaving 7 feet and 4 inches as the length of the frond. The first internode is 22 inches, the 2d, 16¼ inches, the 3d, 10¾ inches with a corresponding decrease up to the 16th internode which measures only ½ an inch, the apex measuring 2 inches, and the remaining measurements being taken up by the spaces occupied by the bases of the connecting stalks of the primary divisions.

As the primary divisions were taken off to admit of folding the stalk and rachis for mailing without breaking, I can only guess at the probable breadth of the frond; but as the frond of the common brake is nearly triangular in outline, and generally quite as broad at the base

as it is long, this one could not have spread less than 7 feet across the lower primary divisions, each one of which must have been 3 if not 3½ feet long with a corresponding breadth at the base.

The specimen was found in Brevard county and Mr. White writes me that there were others equally as large, *if not larger* in the same hummock.

Nearly all of the English authors state that the common brake in England often attains the height of 10 and 12 feet, and Hooker mentions that Dr. Spruce saw it growing in the Andes 14 feet high, but the dimensions of the present huge specimen exceed any heretofore recorded in this country, and make the old tradition of the Duke of Monmouth's hiding beneath the shelter of a clump of this fern both possible and probable.—GEO. E. DAVENPORT, *Medford, Mass., Feb. 10th, 1880.*

COLORED FLOWERS AND INSECTS.—I am sure many readers of the BOTANICAL GAZETTE feel indebted to your correspondent who showed in the last number that *Pringlea* was a cruciferous and not a coniferous plant, with some other facts in regard to the Flora of Kerguelen's Land. It would I am sure add to our obligation if he would tell us whether on this Island, or on "islands where winged insects are either scarce or wanting" there are plants with flowers having showy petals, or other properties attractive to winged insects. It does not, as he remarks, seem strange that a plant with inconspicuous flowers should exist where there are no winged insects to carry pollen,—but the converse which the *Pringlea* case may have been intended to illustrate, might be worthy of consideration. What I have read of *Pringlea* indicated a belief that it had in the past either failed to develop showy petals, because no winged insects had ever encouraged it to do so,—or that these showy petals became inconspicuous, after having lost, what it formerly enjoyed, the opportunity to secure insect aid,—but it would be interesting to know why other species have not gone and done likewise, if any such there be. Perhaps it is in this direction that the interest in *Pringlea* centres, as much as in whether it is a "cruciferous" or a "coniferous" plant. While this error certainly served to amuse, the information sought may instruct us.--*.

GROWTH OF TREES.—At a meeting of the Botanical Society of Edinburg, held on Thursday, Jan. 8th, Sir Robert Christison read a paper of very considerable importance on the relative growth of the trunks of trees during 1879, as compared with 1878. Upwards of two years ago Sir Robert set on foot a system of measurements of the girths of a large number of well grown trees in Edinburgh and neighborhood, the measurements being made by himself with the same measuring-line and the same circumference to be measured secured by marking it at the time of first measurement with paint. The inclement character of the summer months of 1879, as compared with 1878, was described by reference to the daily maximum temperatures noted at the Edinburgh station of the Scottish Meteorological Society from

which it appeared that for the six months ending with September the mean for 1879 was fully 5° less than for 1878, the deficiency of day temperature amounting to nearly 10°. Of 11 deciduous trees, exclusive of oaks, the deficiency of growth during 1879 as compared with 1878 was 42 per cent.; of 17 evergreens of the pine tribe the deficiency was 20 per cent.; and of 7 oaks the deficiency was 10 per cent. The 7 oaks were of different species but they gave results closely agreeing with each other. — *Nature.*

BULLETIN OF THE TORREY BOTANICAL CLUB.—After ten years of quiet, unassuming life, this publication has blossomed out in a fashion that gratifies its friends. Vol. VII, No. 1, appears with a cover, 12 pages of reading matter and two plates. Four years ago the Bulletin complimented us by saying that we had patterned after it, and now we intend to return the compliment and say that the Bulletin has at last followed the example set by the GAZETTE as to number of pages and cover and surpassed us in the matter of plates. The number before us contains four articles, the first page being devoted to proceedings of the Torrey club; the next seven are taken up by an article from Mr. C. F. Austin, in which he makes some very severe criticisms upon Lesquereux and James' last paper upon North American Mosses. Then comes a description of a new fungus, by W. R. Gerard, and it is to this that that the two plates are devoted. The new fungus is a species of *Simblum*, a genus hitherto considered exclusively tropical. The type specimens were collected in Long Island. The fourth paper is a short list of plants, being additions to the flora of Richmond county, N. Y.

So the number ends, with no intimation whether this new order of things is to be kept up or not, probably deeming it safer to promise nothing. But, seriously, we are charmed with this evidence of progress and wish our esteemed contemporary all the success it so richly deserves.

GOOD NEWS TO BOTANISTS.—The following correspondence explains itself. The facts stated may not be new to some exchangers, but have never been made known before from official sources.

LAFAYETTE, IND., Jan. 15, 1880.

D. M. KEY, P. M. General, Washington D. C.:

DEAR SIR:—Under the present law cannot labels such as the enclosed (an ordinary botanical label) be placed in a package of specimens of dried plants without subjecting them to higher than merchandise rates? Very respectfully,

CHAS. R. BARNES.

POST OFFICE DEPARTMENT, OFFICE OF THE FIRST ASSISTANT POSTMASTER GENERAL,

WASHINGTON, Jan. 24, 1880.

Respectfully returned to Charles R. Barnes, Esq., Lafayette, Tippecanoe county, Indiana, with the statement that, under the provisions of section 231, Postal Laws and Regulations, labels, such as that

submitted, may be sent with packages of botanical specimens without subjecting them to a higher rate of postage.

JAMES H. MARR,
For First Ass't P. M. General.

RHODE ISLAND PLANTS.—I have to report the finding of *Aster concolor*, L., at S. Kingston, R. I., by Miss Barstow, of Providence, and of *Aster Herveyi*, Gray, at Tiverton, R. I., by Prof. C. S. Sargent, of the Harvard Arboretum. They are good additions to our peculiar Flora.—W. W. BAILEY.

NEW SPECIES OF FUNGI, BY CHAS. H. PECK.—STEMONITIS MORGANI.—Plants crowded, growing from a well-developed hypothallus, one-half to two-thirds of an inch high; sporangia cylindrical, three or four times the length of the stem; stem black, shining, prolonged as a columella nearly to the apex of the sporangium; meshes of the capillitium very large, the knots sometimes thickened and subtriangular; spores violet-brown, globose, .0003 of an inch in diameter, with a slight ferruginous tint in the mass.

Decaying vegetable matter. Ohio. *A. P. Morgan.* Pennsylvania. *W. Barbeck.*

Externally this species closely resembles *S. fusca*, from which it seems necessary to separate it because of its paler slightly ferruginous-tinted spores and the very large surface meshes of its capillitium. The spores are larger and in the mass considerably darker than those of *S. ferruginea.*

CONIOTHYRIUM MINUTULUM.—Perithecia minute, .0045–.0055 of an inch broad, scattered, subglobose or depressed, black; spores minute, oblong-ovate or elliptical, colorless, .00015–.00016 of an inch long, about .00008 of an inch broad.

Whitened decorticated surface of hard wood. Vermont. *C. G. Pringle.*

The perithecia are so minute that they are scarcely visible to the naked eye. The upper part of the perithecium ruptures irregularly and at length falls away leaving the lower part sunk in the matrix.

This and the other Vermont species here described were collected by Mr. Pringle, but communicated to me by *Mr. C. J. Sprague.*

LEPTOTHYRIUM CHROMOSPERMUM.—Spots none; perithecia amphigenous, scattered, orbicular, membranous, easily separating from the matrix, wrinkled when dry, black, about .015 of an inch broad; spores numerous, regular, elliptical, colored, .00045–.00055 of an inch long, .00035–.0004 of an inch broad.

Living rose leaves. Ohio. *T. Taylor.*

The perithecia are easily scraped from the leaf by the blade of a pen-knife. The base is margined by a thin colorless membrane which comes off with the perithecia. The spores in the mass have a pale yellowish-brown color.

PHOMA ALBISTRATA.—Perithecia minute, .007–.008 of an inch broad, seated on a thin whitish crustaceous stratum, scattered, conical or subglobose, nearly free, easily separated from the matrix, black;

spores ovate-elliptical, slightly colored, binucleate, .0002–.0003 of an inch long, .00016–.0002 of an inch broad.

Bark of arbor-vitae. Vermont. *C. G. Pringle.*

This fungus is sparingly accompanied by a *Sphaeria* to be hereafter described. I am not sure that the whitish crust belongs to or has anything to do with the fungus. Its presence may be accidental but it occurs in all the specimens before me. The spores are brownish in the mass.

PHOMA COLORATA.—Perithecia minute, .006–.008 of an inch broad, nearly free, hemispherical or subconical, sometimes depressed when dry, black; spores minute. broadly elliptical, simple, colored, .0002–.00025 of an inch long.

Surface of wood. Vermont. *C. G. Pringle.*

This species is closely related to the preceding one but it is accompanied by no whitish crust and the spores are smaller, more highly colored and destitute of nuclei. They are brown in the mass. The perithecia grow intermingled with a species of *Patellaria.*

SEPTORIA CONSOCIA.–Perithecia minute, .0025–.003 of an inch broad, closely gregarious, amphigenous, black; spores filiform, nearly straight, .0006–.0008 of an inch long.

Living or languishing leaves of Seneca snake-root, *Polygala Senega.* Michigan. *V. M. Spalding.*

The perithecia manifest a tendency to grow in groups or clusters. They are associated with a species of Æcidium

SEPTORIA IRREGULARE.—Spots small, angular, often confluent. at first yellowish above, then reddish-brown with a narrow darker border, brown or grayish-brown beneath; perithecia hypophyllous, sometimes amphigenous, irregular, black; spores numerous, filiform, colorless, .0012.–0018 of an inch long.

Living leaves of poison sumach, *Rhus Toxicodendron.* Illinois. *J. Wolff.* Communicated by *S. A. Forbes.*

This is clearly distinct from *S. rhoidis* B.&C. in the spots, perithecia and spores. The latter sometimes appear as if obscurely uniseptate.

DISCELLA VARIABILIS.—Perithecia orbicular oblong or hysteriiform, rupturing irregularly and revealing the pallid or blackish disk, black; spores elliptical-oblong, colorless, .0003–.0004 of an inch long, about .00016 of an inch broad.

Decorticated surface of wood. Vermont. *C. G. Pringle.*

When moist the perithecia open more widely and then by reason of the toothed margin the orbicular ones resemble species of Phacidium. The elongated ones resemble species of Hysterium or Triblidium. They are often partly concealed by the overlying fibers of the wood.

SPORIDESMIUM MINUTISSIMUM. — Spores irregular, multicellular, opake, without any distinct base, generally subglobose or broadly elliptical, .0005–.00065 of an inch long, collected in minute, scattered black tufts which are .004- 005 of an inch in diameter.

Whitened surface of decaying wood. Vermont. *C. G. Pringle.*

ÆCIDIUM JAMESIANUM.—Spots suborbicular, yellowish-green; peridia mostly hypophyllous, rarely amphigenous, loosely clustered, pustuliform, opening by a small aperture; spores subglobose, .0008–.001

of an inch in diameter, orange-yellow, with a thick hyaline epispore.

Living leaves of *Asclepias Jamesii*. New Mexico. *T. S. Brandegee.* Communicated by *E. A. Rau.*

This species is quite distinct from *Æ. Brandegei* which also occurs on Asclepias leaves.

LECYTHEA MACROSORA.—Sori amphigenous, large, pulvinate, yellow, surrounded by the ruptured epidermis, often crowded or confluent; spores obovate or subglobose, rough, .0006–.0008 of an inch long; paraphyses smooth, capitate, the globose or obovate head .001–.0012 of an inch long.

Living leaves of *Epilobium tetragonum*. Colorado. *T. S. Brandegee.* Communicated by *E. A. Rau.*

SOROSPORIUM ATRUM.—Spore balls very unequal, .0006–.0016 of an inch in diameter, polymorphous but most often subglobose, composed of few or many spores according to the size, compact, separating with difficulty into their component spores, black; spores subglobose, minutely granular, .0003–.0005 of an inch in diameter.

Perigynia of *Carex Pennsylvanica*. Colorado. *M. E. Jones.*

The fungus fills the perigynia with its black dusty mass of spore balls. It was found in June at an altitude of about 6000 feet.

CHEIROMYCES TINCTUS.—Scattered, black, erumpent in minute hysteriiform chinks; spores with two to five divisions, .0005–.0008 of an inch long, one to three septate, often a little constricted at the septa, tinged with blue.

Decaying wood. Vermont. *C. G. Pringle.*

In external appearance this resembles very closely *C. Beaumontii*, B.&C., of which Dr. Curtis distributed specimens but of which I have seen no description. In it the spores are smaller, of a brown color and destitute of septa. The blue color of the spores in the present species is clearly seen when the fungus is moistened and crushed on the slide of the microscope.

PEZIZA SPONGIOSA.—Cups large, one inch or more broad, concave or infundibuliform, thin, soft, externally black, the hymenium blackish brown, becoming porous when old; stem short, slender, black; asci cylindrical; spores uniseriate, globose, smooth, granular within and often uninucleate, .0005 of an inch in diameter; paraphyses filiform, colored, circinate or uncinate-curved at the tips.

Ground under fir trees. Near the summit of Mt Mansfield, Vermont. May. *C. G. Pringle.*

The hymenium in all the specimens is porous or spongy. I am not sure that this character exists in the young and fresh plants. It sometimes occurs in *Peziza badia*. The description was derived from dried specimens and the colors may not accurately correspond to the hues of the fresh plant. The globose spores and colored paraphyses with hooked tips are distinguishing characters of the species. It belongs to the section Cupulares.

PHACIDIUM SPARSUM.—Perithecia minute, .014–.02 of an inch broad, few, scattered, black, with a few blunt teeth and a black disk; asci short, clavate; spores crowded, oblong, sometimes slightly narrowed toward one end, colorless, .0005–.0006 of an inch long, about

.00016 of an inch broad; paraphyses filiform, often longer than the asci.

Decaying wood. Vermont. *C. G. Pringle.*

This fungus is easily overlooked by reason of its small size and scattered mode of growth. The marginal teeth are sometimes obsolete and then the plant looks like a Triblidium.

STICTIS FULVA.—Receptacle erumpent, slightly margined, thin, orbicular or oblong-elliptical, about one line long, pale tawny or subochraceous; asci subcylindrical; spores nearly colorless, oblong-elliptical, .0006–.0008 of an inch long, .00025–.0003 of an inch broad, sometimes containing one or two nuclei; paraphyses filiform.

Decaying wood. Vermont. *C. G. Pringle.*

This fungus belongs to the subgenus Propolis as indicated by its dusty-appearing hymenium. It is very closely related to *S. versicolor.*

DIATRYPE ANGULARE.—Stroma small, scarcely one line broad, erumpent, externally black or blackish-brown, within slightly reddish-brown; perithecia large, few, one to six; ostiola very prominent, angular, compressed or pyramidal, asci cylindrical; spores large, uniseriate, uniseptate, colored, oblong or elliptical, obtuse, very variable in length, .0011–.0022 of an inch long, .0006–.0007 of an inch broad.

Bark of bass wood, *Tilia Americana.* Vermont. May. *C. G. Pringle.*

The stroma does not penetrate to the wood. The very prominent angular ostiola are often arranged in such a manner as to give a radiate-sulcate appearance to the upper part of the stroma. The spores are black in the mass and the longest ones are sometimes slightly narrowed in the middle.

SPHÆRIA ALTIPETA.—Perithecia minute, subglobose, immersed, black; ostiola emergent, subconical or cylindrical, nearly as long as the perithecia; asci cylindrical; spores uniseriate, oblong, colored, .00065 of an inch long, about .0002 of an inch broad, hyaline at one end, uniseptate near the other.

Decaying wood. Mt. Washington. *C. G. Pringle.*

The perithecia sometimes occur in long lines. When young the spores are colorless, but they soon become colored, except at one end, and contain two nuclei. Finally a septum is formed near the colored end of the spore. The species should be referred to the Ceratostomæ.

SPHÆRIA LICHENALIS.—Perithecia scattered, minute, .008–.011 of an inch broad, subhemispherical, erumpent, black; ostiola papilliform; asci oblong-elliptical; spores crowded, oblong, multiseptate, fenestrate, greenish-yellow, .0014–.0016 of an inch long, .0004–.0005 of an inch broad.

Bark of birch trees. Vermont. *C. G. Pringle.*

The perithecia occupy a discolored spot which gives a lichenose aspect to the fungus. Sometimes two or three are seriately crowded or confluent, in which case they present a hysteriiform appearance to the naked eye. The species, though peculiar in its habitat, may be referred to the section Pleospora.